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### REMARKS

Claims 1-4, 17-28, and 35 were rejected under 35 USC 103 as being unpatentable over Galand et al, US Patent 6,038,212 ( "Galand"), in view of Burdett US Patent 6,327,675 ( "Burdett"). Applicants respectfully traverse.

Galand teaches an arrangement that comprises access nodes and transit nodes. End users are connected to the network through the access nodes. Each of the nodes includes a database (206) that stores an image of the network, and a controller (205). In the case of access nodes, controller 205 performs a Trunk Connection Management function and serves as the connection agent, and the database also has information about the number  $N_i$  of connections that are currently supported by the network trunk. Whenever a change occurs in the network such as when a link is added or removed (due to failure, or otherwise) a control message is broadcast through the network to so that controller 205 in each of the nodes can appropriately modify its database 206. Galand recognizes that the control messages, which spread through the network in order to maintain consistency, constitute an overhead on the network, and an undue amount of such control messages is undesirable; "not to mention the case of simultaneous network failures which aggregates the situation." (col. 10, lines 20-21). Therefore, Galand provides "synchronized rerouting process optimizing additional installation cost and available networks, while minimizing required bandwidth and time" (col. 10, lines 28-31).

According to Galand, when a trunk failure is detected, each access node that supports connections which are affected by the failed trunk is informed by the node that detects the trunk failure, and each of the affected access nodes starts a reconnection setup process that aims to circumvent the failed trunk. The important point to note here is that it is the **affected access nodes** that start the reconnection setup, which is a two-fold condition: (1) affected, and (2) access nodes. The "affected access nodes" are not *structural* entities but *operational* entities. At one time access node A might be affected by a particular link, and at another time access node B might be affected by the particular link. Stated in other words, a node is not an "affected access node" unless it is an access node (structural condition), and it is affected by the failure is some other node (operational condition).

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In contradistinction, claim 1 specifies a communication network where **each** of the network nodes comprises a processor module that is either a control module or a backup module.

As a control module, it triggers a rerouting in response to a failure indication associated with a link bundle. In connection with this, the Examiner might argue that a node that detects a failure and broadcasts a message is a control node that meets the claim's specification because it triggers an action and, therefore, all of the nodes in the Galand network are control nodes.

As a backup node, it triggers rerouting in response to a failure indication associated with the link when the control node is unresponsive. None of the Galand nodes is adapted to be a backup node and, therefore, the limitation of claim 1 is not met. The Examiner has effectively admitted this fact; though he expressed it slightly differently in the last two lines of page 2 of the Office action (and applicants' view is that applicants' characterization of the Galand failing is more accurate than the Examiner's characterization).

In consequence of this admission, the Examiner cites the Burdett reference, asserting that in claims 1-4 of the reference and the respective portions of the specification Burdett disclose "a node such as a data communication switch that comprises of one primary processing module and one spare module capable of processing data that sense a failure of the primary module ...."

Applicants respectfully submit that the teaching of Burdett, when combined with the teachings of Galand do not result in an arrangement that is the same as, or suggestive of, the arrangement defined in applicants' claim 1.

What Burdett teaches is the use of a switch that has a plurality of functional processors (FPs), and one of them is a spare FB. A spare FB, by definition of the term "spare," is an FP that is kept in reserve. It is not used, until needed. Burdett teaches that communication that normally goes through an FP that failed is switches to go through the FP that had been held in reserve. The whole operation appears to be within the switch. Neighboring switches are not involved.

In applicants' view, it makes no sense to incorporate the teachings of Burdett in the Galand arrangement because Galand teaches reconfiguring the calls to bypass the

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failed node, whereas Burdett teaches moving the data that needs to flow through the failed FP within a switch to a spare FP within the switch. This is a totally different approach. Moreover, if the process taught by Galand works effectively, then the use of a spare is wholly unnecessary and, therefore there is no motivation to incorporate the teachings of Burdett into the Galand system. Conversely, if use of a spare FP works effectively, there is no need to route traffic away from the switch that contains a failed FP; so, again, there is no motivation to combine Burdett with Galand.

Put another way, if one were to combine the two references, one would have a system where a switch with a failed FP will have data moved to a spare FP, and the data to the switch itself would also be rerouted. That would be wholly unnecessary, and no skilled artisan would consider doing it.

In view of this major structural difference, applicants respectfully submit that claim 1 is not obvious in view of the Galand-Burdett combination of references. Since claim 1 is not obvious, it follows that claims 2-4, which depend on claim 1, are also not obvious.

As for claim 17, it specifies the node, rather than the network - as claim 1 does. According to claim 17 the node includes a processing module that determines, with respect to each of its ports, whether the node is a control node that triggers rerouting in response to a failure indication associated with said ports, or is a backup node that triggers rerouting in response to a failure indication associated with said ports only when another apparatus is unresponsive. By clear implications, a node can be a control node with respect to some of its ports and a backup node with respect to other of its ports.

As demonstrated above, none of the nodes described by Galand are such nodes, and none of the teachings by Burdett suggest modifying the nodes to be such nodes. This is especially true for the notion of a being a control node with respect to some of its ports and a backup node with respect to other of its ports. Therefore, it is respectfully submitted that claim 17, and all claims that depend thereon (that is, claims 18-28) are not obvious in view of the Galand and Burdett combination of references.

It may be noted that in connection with claims 18-21, the Examiner asserts that Burdett teaches processing modules that have slots designated for spare processor and that, therefore, "spare capacity information from other apparatus is connected to

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apparatus via ports and broadcasted to receive status change by the control processor" (page 4 of the Office Action). Applicants respectfully disagree. Nowhere in the Burdett specification is the notion of broadcasting presented or suggested. The fact that a switch maintains information about its spare functional processor does not necessitate *broadcasting* even within the switch, and it certainly does not necessitate, or suggest, broadcasting any information outside the switch. Sparing panel 18 of the reference actually insures that there would be no need to provide information outside the switch regarding the FPs that are being used.

The Examiner also asserts that it is obvious "to modify the teachings of Galand to include the teachings of Burdett in order to redirect traffic to spares that would ensure that no data will be lost" (page 4 of the Office Action). Again applicants disagree and respectfully direct the Examiner's attention to the above argument, which demonstrates that including the Burdett teaching provides absolutely no benefit, and in fact is contra-indicated.

As for the claims at issue, claim 18 specifies an apparatus (node/switch) that receives status information that includes spare capacity information from another apparatus of like kind; not from a separate FP. Claim 19 specifies receiving status change information, under limitations that are similar to those of claim 18. Applicants respectfully submit that such apparatus is quite different from apparatus that includes a plurality of FPs in a switch, where one of them is a spare FP.

Claims 20 and 21 elaborate on claim 19.

In connection with claims 24-28, the Examiner combines the rerouting notion of Galand, where traffic that passed through a failed node is rerouted, causing other nodes and other links in the network to carry traffic, with the spare FP notion of Burdett. As demonstrated above, it makes no sense to combine these two notions.

Moreover, claims 24-28 depend on claim 19 and introduce additional limitations, which are not shown or suggested by the references (taken singly or combined), and the Examiner has not made explicit comments that assert those limitations to be obvious; for example, generating a set of re-routing plans for those failures for which said apparatus is a control node, and forwarding those plans to specifically addressed other apparatus.

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Claims 29-34 were rejected under 35 USC 103 as being unpatentable over Hsing, US Patent 6,167,025 in view of Burdett. Applicants respectfully traverse.

Claim 29 specifies a step of receiving a message indicative of a change in resources at another node, where the message includes information regarding number of node hops through which said message arrived at said network node, and a step of broadcasting the message when the number of hops is less than a preselected number.

Hsing describes a method for restoring connections in an ATM network. The method contemplates detection of an error, when it occurs, directing the neighboring upstream ATM switch to initiate employing alternate routing, and directing the neighboring downstream ATM switch to begin process to release capacity. The information regarding the alternate route (which effectively is the same as establishing a connection) and the information regarding the release of resources is spread from one ATM switch to a next ATM switch based on information contained in a routing table of the switch; one hop at a time.

Col. 15, lines 8-22 describe the nature of this information. This passage states

As illustrated, the re-route setup message 1802 includes the call identifier, the source switch identifier, and the destination switch identifier for the call being re-routed. In addition, the re-route setup message includes the identifier of the switch initiating the re-route setup message, e.g., the identifier of the neighboring upstream switch detecting the failure in the case of a hop-by-hop routing embodiment. The re-route setup message also includes a re-route count. This value corresponds to the re-route count obtained from the call record of the switch generating the setup message incremented by 1 to reflect the occurrence of a new failure event. The re-route setup message also includes additional information, e.g., path information, etc. Note that the re-route setup message includes much of the information required to update a switch's call record upon rerouting. (emphasis supplied)

It is noted that none of the information contained in the re-route message contains **number** of hops, which is a notion specified in the first step of claim 29.

Additionally, the spreading of information in the Hsing reference is directed, according to specification in the routing table, which is contrary to **broadcasting**, as specified in claim 29. Broadcasting is an undirected method of spreading information. Viewed another way, the Hsing method of spreading information is controlled by the element that possesses the information and wishes to spread it, whereas in claim 29

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method, which specifies broadcasting, the spreading information is controlled by the element that is willing to receive information and act upon it.

The Burdett reference is cited – based on column 7 and claims 9-13 – for the proposition that it teaches that a “control processor redirects traffic based on a failed link or status change and generates a plan and provides instruction to the back processor of the redirecting path.” Applicants respectfully disagree. Neither the cited column 7, nor claims 9-13 even mention the word “link,” and the whole thrust of the Burdett disclosure relates to possible failures of functional processors within a switch. Indeed, these passages also do not mention “status change,” or “plan,” and the only redirecting of traffic that occurs is when a “primary module” fails for longer than a predetermined time interval.

Since the Hsing reference does not suggest either of the two steps defined in claim 29, and since the Burdett reference also does not suggest these steps, it follows that claim 29 is clearly not obvious in view of the Hsing and Burdett combination of references. Consequently, claims 30-34, which depend on claim 29, are also not obvious in view of the Hsing and Burdett combination of references.

Claims 5-7, 10, 15, 16, 36, and 37 were rejected under 35 USC 103 as being unpatentable over Arslan et al, US Patent 5,706,276 (Arslan) in view of Hsing. Applicants respectfully traverse.

Independent claim 5 specifies that each node in the network has a specified neighborhood, that different nodes may have neighborhoods of different size, and that a plan is stored in each node that is associated with the neighborhood. The notion of a neighborhood is described in the specification, so its meaning in claim 5 is unambiguous. However, to make the claim more definite, amended claim 5 specifies that a neighborhood is defined by the number of hops that are included in the neighborhood, and the plan that is **associated with** the node's neighborhood is also made more definite by specifying that it that affects the neighborhood. These amendments to the specification make explicit the limitations that were already in the claim, and are not introduced to overcome the prior art.

The Examiner asserts that Arslan teaches an arrangement where link bundles interconnect nodes and that each node has a neighborhood  $M_p$  that is **associated with**

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each node  $N_p$ , where neighborhood  $M_p$  may be different in size from neighborhood  $M_q$ . Applicants respectfully disagree. Arslan does not present, describe, or suggest any notion of neighborhoods, of whatever size, that is associated with any node. A person may impute such a notion to any network, but the fact is that this notion is neither disclosed nor suggested in Arslan.

The Examiner admits that Arslan does not have a notion of receiving information about spare capacity in the neighborhood, and that Arslan does not have a notion of a restoration plan; however the Examiner asserts that Hsing does. Applicants respectfully submit that Hsing does not have a notion of a neighborhood, and does not have a notion of a plan for a neighborhood. All that Hsing teaches is that if a failure is detected in a node, the node that is immediately upstream from the failed node is called upon to perform a function, and the node that is immediately down stream from the failed node is also called upon to perform a function. That does not teach or suggest a neighborhood as claim 5 specifies, and it does not teach or suggest a plan as claim 5 specifies (or pointers to such a plan).

The notion of a neighborhood is not present in the Hsing teachings in columns 13-16, as asserted by the Examiner, and certainly there is nothing in the Hsing reference that is suggestive of neighborhoods that are of different size – as claim 5 specifies.

Therefore, it is respectfully submitted that claim 5 is not obvious in view of Arslan and Hsing combination of references, and nor are claims 6-7, 10, 15 and 16, which depend on claim 5.

Claim 36 is amended herein to made the node limitation more concrete by specifying that it actually includes information that imparts a partitioning of the network, instead of specifying that it is constructed to impart (in case the Examiner believes that this does not actually calls for effecting the partitioning), and by specifying that a neighborhood can include more than one hop. As amended, applicants believe that the arguments put forth in connection with claim 5 apply to claim 36 and that, therefore, claim 36, and claim 37 (which depends on amended claim 36) are not obvious in view of the Arslan and Hsing combination of references.

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Claims 38-46 were rejected under 35 USC 103 as being unpatentable over Arslan in view of Hsing and further in view of Commerford, US Patent 6,134,671. Applicants respectfully traverse.

The Commerford reference is presented for its alleged teaching of dynamically generating restoration routes within a communication network. Those teachings do not supply that which is missing in the Arslan and Hsing references relative to the limitations of claim 36, discussed above, which make the claim upon which claims 38-46 depend, not obvious. Since the base claim on which claims 38-46 depend is not obvious in view of the Arslan, Hsing, and Commerford combination of references, it follows that the dependent claims 38-46 are also not obvious in view of this set of references.

Claims 8, 9, 11-14, 22, and 23 were indicated to be allowable, but for the fact that they depend on a rejected claims. It is respectfully submitted that, in light of the above amendments and remarks, these claims are allowable.

Indeed, in light of the above amendments and remarks, applicants believe that all of the Examiner's rejections have been overcome. Reconsideration and allowance of claims 1-34, as well as newly added claims 35-46, are respectfully solicited.

Respectfully,  
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